

ART. I.—*Notes on the Earthquake in Gipps Land.*

By R. L. J. ELLERY, ESQ.

[Read 30th August, 1869.]

The Australian Colonies are fortunately seldom visited with earthquakes of any severity, the worst rarely causing more damage than the rattling of crockery and the alarm of the more nervous of the inhabitants. The Rev. W. B. Clarke, of Sydney, in a paper he read before the Royal Society of New South Wales, on September 2, 1868, gave a catalogue of 160 earthquakes that had been noted in Australia between the years 1773 and 1868, and although none of these were of alarming intensity, this veteran observer justly remarks—"Looking at the condition of Australia, so far as is known, and to the history of such shocks as have been before recorded, we are, I hope, at present, physically considered, in no fear of any such great convulsion as has often overthrown cities and desolated vast regions in a few moments; and yet when we read the records of such disasters as have been chronicled, we have no right to presume that this country may never be so affected."

Our knowledge of the cause of earthquakes and of their relation, if any, with other telluric or cosmical conditions, however, has never yet been sufficient for founding a tenable hypothesis; and it is only by carefully noting the peculiarities of these disturbances, in connection with other phenomena, that we are likely to get more knowledge. And this will be my excuse for occupying your time with a few dry notes concerning the earthquake felt in Gipps Land in August; for, in doing so, all that is now known of this occurrence becomes recorded for after reference and use.

Mr. Mallet (the highest authority upon the subject) has so thoroughly systematised what is known, that searchers after earthquake information cannot do better than consult his exhaustive reports on earthquakes, in the proceedings of the British Association.

On August 30, I received the following telegram from Mr. Saxe, the telegraph manager at Bairnsdale:—"About 4.50 this morning two severe shocks of earthquake were felt here. The first shock lasted about a second; then an interval of a second, and then another shock of quite thirty seconds'

duration. A rumbling noise was heard for about three minutes after the shocks. The wave seemed to travel from west to east. Many persons ran out of their houses, fearing that they would fall." Two days after I received the following information from Mr. John Oliver, Deptford, Gipps Land:—"I think it may interest you to know that we felt a smart shock of an earthquake at this township this morning at twelve minutes to five o'clock. It lasted fully one minute, and was followed about ten minutes afterwards by a sound which I supposed to be distant thunder. While the earthquake shock lasted, a dull deep sound was heard; the earth trembled, and everything indoors shook. I was up at the time, and looked at my watch immediately I heard the sound passing. The morning was dark, and a drizzling rain falling. To-day thunder has been rolling about. Any further information you may want, if I can supply it, I will gladly send you. Quarter-past eight o'clock Monday night: I had just written so far when we had *another shock*, which lasted about thirty seconds. The night is very dark and cloudy; people here are rather alarmed. Tuesday: Raining heavily all day with thunder, accompanied with hail showers. Wednesday: Fine warm day." In reply to some questions I asked, Mr. Oliver subsequently informed me that "The trembling and rumbling noise felt and heard by us was continuously apparent through the whole of the minute. It shook the earth and everything inside my dwelling; and the noise was quite loud. It seemed to increase as it passed, and died away just as a wind comes over the tree tops, blows hard, and speeds on. The second shock occurred as I was writing my note to you. It was of the same character as the one in the morning, and shook the seat I was sitting on and the writing table. I can only liken the sound to that of a heavy goods' train passing a wooden bridge. I feel convinced that it came from *the west and travelled to the east*; but I would not say it was due west and east, because I am not sure."

Mr. Turton, geodetic surveyor, who was camped at Little Ram Head, about 22 miles west of Cape Howe, sent me the following:—"Mr. Newton reports that when at the Snowy River, on August 30 at five a.m., he felt a very sharp shock of an earthquake. He was awoke by a loud rumbling noise, and immediately afterwards the building and all it contained began to rock violently; the inmates were much frightened."

“ It did not extend as far east as my camp at the Little Ram Head, nor to Wingan Inlet. But there was something very peculiar in the atmosphere; I could not sleep, and was walking about from midnight to daylight. The air was very still, but I did not notice the slightest tremor of the earth. One of the party was camped out at Wingan Inlet, and he was up at four a.m., but did not perceive any indication of the earthquake.”

From the *Ovens and Murray Advertiser* we ascertain that “ a smart shock of an earthquake was felt at Beechworth, between four and five on Monday morning 30th. The wave appeared to pass from the south-west towards the north-east, and was accompanied by a dull rumbling noise, not unlike the sound of a train in motion. In several houses the occupants were awakened by the jingling of the glass and crockery on the shelves, whilst others were aroused from their slumbers by the shaking of the beds, and an unpleasant swaying motion given to the buildings. The shock, which is variously described to have lasted from three to fifteen seconds, seems to have been felt over a large extent of the hill country, but not, so far as we have heard, on the plains. A telegram from Bright informs us that a smart vibration was felt in that locality at a quarter to five o'clock, much about the same time it was experienced in Beechworth.” It was also felt at the Buckland and at Albury.

The direction of the earthquake appears from the evidence to be very doubtful, as it always is. Mr. Oliver, who seems to have noted the occurrence carefully, feels confident of its having approached from a westerly direction. At Beechworth it was noted to have approached from the south-west, Mr. Saxe says from “ west to east.” At Albury, it is stated to have travelled “ north and south,” that perhaps means from south to north. The time of the first shock was not given precisely, except by Mr. Saxe and Mr. Oliver. Mr. Saxe says 4.50 a.m.; Mr. Oliver, 12 minutes to five. At Beechworth, between four and five is named. Any estimation of the direction from the difference of times noted is therefore out of the question. But I think we may safely assume that the direction was nearly north and south, probably S.S.W. to N.N.W., and that the line of principal intensity extended from the coast line, somewhat west of the Lake's entrance, northwards through Buckland and Bright, between the Buffalo and Bogong Ranges to Yackandandah, Beechworth and Albury. The weather at the time was generally

described as *calm* and somewhat sultry. Mr. Turton remarks, "something peculiar in the atmosphere." At Deptford, "drizzling rain was falling." No sign of the shock was experienced at Port Albert, at which place the barometer stood at 29.88, with light winds from the N.E.

A careful examination of the various magnetic and meteorological records at the time of the earthquake discovers no trace whatever of any disturbance of terrestrial magnetism, or of any marked atmospheric change. The barometer at the time was steady, and about 29.80 inch. From 9 a.m. till 7 p.m. on the day previous there was a disturbed state of the barometer, with a downward tendency; but this was accounted for by a strong northerly wind, which was blowing till 5.15 p.m., when it shifted to the S.W. with heavy squalls and a little rain. Although the magnetograms (exhibited) show a very marked and considerable disturbance in terrestrial magnetism for some twelve or fourteen hours prior to the time of the earthquake, yet this had quieted down by about 2 a.m.; the earthquake occurring at 5.50 a.m.

The state of atmospheric electricity as shown by the electrogram was almost quiescent at the time, although preceded, as in the case of the barometer, by great disturbances, principally of negative tension, as is usually the case with strong, dry northerly winds.

The length of time over which the rumbling noise was heard appears remarkable for a case of such slight disturbance. At first I doubted the correctness of the statement that the vibration continued for over a minute; but Mr. Oliver, in his second letter, replies especially to a query I sent him on this point. He says, "it was continually apparent through the whole of the minute. The second shock also experienced in the evening of the same day lasted thirty seconds."

In this earthquake we have not, as is very frequently the case, a low barometer. It was not high, but 29.80 is but slightly below the average height. The state of the atmosphere was generally reported to have been unusually calm. I heard of no notable disturbance of the sea, nor any unusual wave; if there had been any I believe it would not have escaped notice, either at the mouth of the Snowy River or at the Lake's entrance.